ONTARIO MINISTRY OF ENVIRONMENT
36936000024470

1973

OPERATING SUMMARY

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MINISTRY OF THE
ENVIRONMENT

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PRESCOTT

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1973

Prescott : water pollution contol plant.

81801

Ontario

MINISTRY OF THE ENVIRONMENT

MINISTER
Honourable William G. Newman

DEPUTY MINISTER
E. Biggs

ASSISTANT DEPUTY MINISTER
REGIONAL OPERATIONS
J. Barr

REGIONAL OPERATIONS DIVISION

DIRECTOR, SOUTHEASTERN REGION
E. McIntyre

MANAGER, UTILITY OPERATIONS
A. Symmonds

PRESCOTT

WATER POLLUTION CONTROL PLANT

MINISTRY OF THE ENVIRONMENT

1973 ANNUAL OPERATING SUMMARY

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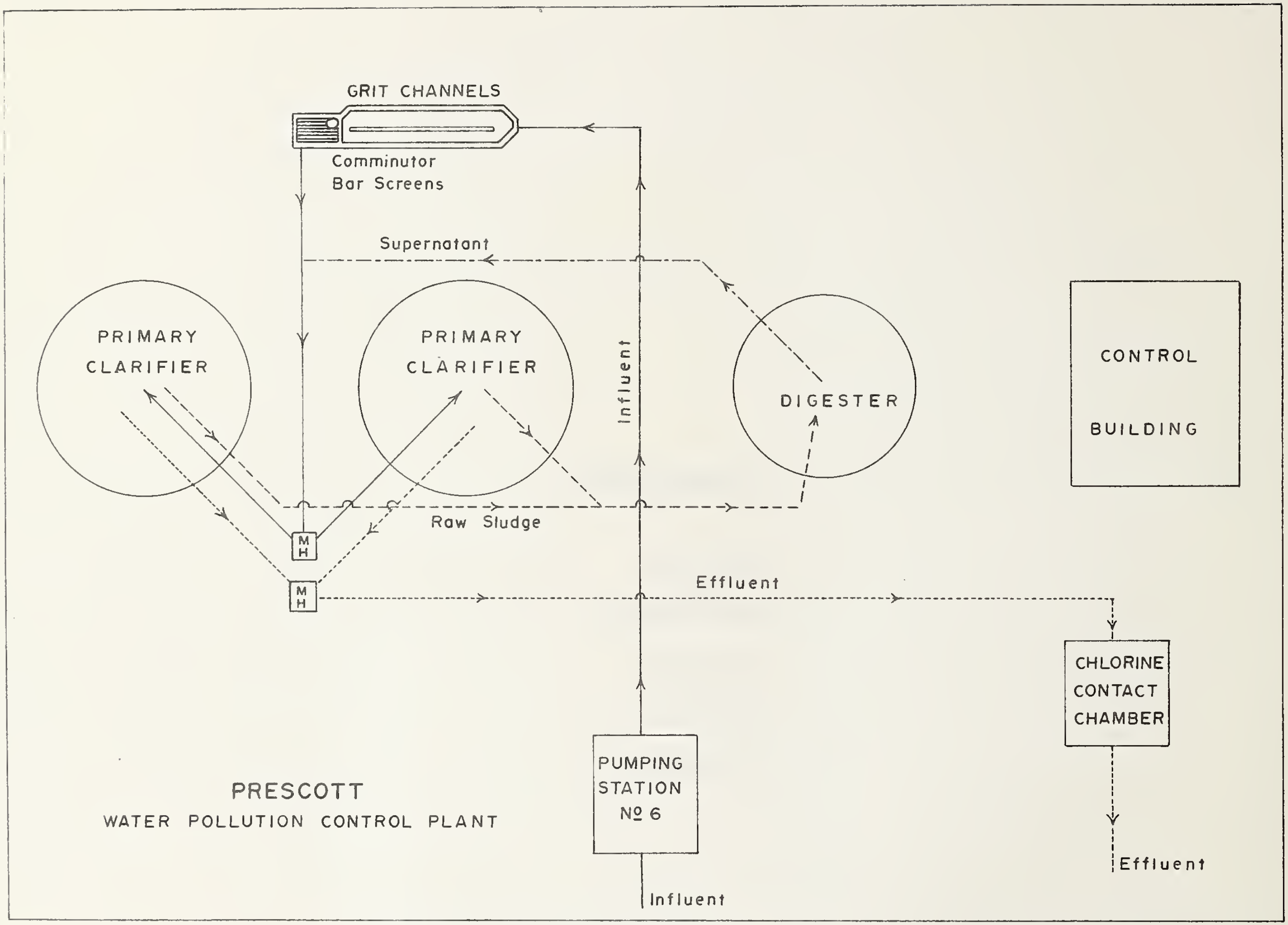


PRESCOTT
WATER POLLUTION CONTROL PLANT

DESIGN DATA

PROJECT NO.	1-0023-66
TREATMENT	Primary
DESIGN FLOW	1.0 MIGD

PRIMARY TREATMENT

Grit Removal

Type: Manually cleaned
Size: Two 26'2" x 3'9" x 3'4"
Flow Velocity: 1.0 fps

Screening

Type: Manually cleaned
Size: 1" openings

Comminution

Type: Worthington #15-5

Primary Sedimentation

Type: Dorr-Oliver
Size: Two 35' dia x 9' swd.
(108, 000 I. gals. total)
Retention: $2\frac{1}{2}$ hours
Loading: Surface 1, 000 I. gals/ft^2/day
Weir, 10, 000 I. gals/ft/day

CHLORINATION

Type: Wallace & Tiernan A-831
Size: Two 50 lbs/day each

Chlorine Contact Chamber

Size: 33, 800 gal.
Retention: 30 minutes

OUTFALL

1650' 42" dia. concrete pipe to St. Lawrence River

SLUDGE HANDLING

Digestion System

Type: Single stage
Size: 35' dia x 18 swd (108, 000 I. Gals)
Loading: 1.6 lb/ft^3/mo.
Recirculation Pump: Smart Turner

PUMPING STATION

a) West Street

Two Smart-Turner, each 870 IGPM @ 36' tdh

b) East Street

Two Smart-Turner, each 1410 IGPM @ 44' tdh

c) Highway 2 & Keefer Street

Two Smart-Turner, each 2100 IGPM @ 76' tdh

d) Plant Site

Three Smart-Turner, 1400 IGPM@ 33' tdh

'73 Review

GENERAL

This project consists of 4 pumping stations, a 1.0 million imperial gallon per day primary treatment plant with single-stage anaerobic digestion, and associated forcemains and gravity sewers.

The three raw sewage pumps in number six sewage pumping station operate on an "on-off" basis. As a result the primary clarifiers are being shock loaded and very poor settling is occurring. A variable-speed motor and pump unit is being designed so that the clarifiers will receive a constant flow thus allowing proper settling. This unit will be installed in the spring of 1974.

All repairs experienced at the project in 1973 were of a minor nature.

PLANT PERFORMANCE

A total of 369.78 million gallons of sewage was treated at the plant during 1973, representing an average flow of 1.01 million gallons per day. The plant was operating at or above design capacity for 40 per cent of 1973.

PLANT LOADINGS

The average influent BOD and suspended solids concentrations were 77 mg/l and 160 mg/l respectively. The effluent BOD and suspended solids concentrations were 46 mg/l and 63 mg/l respectively, representing a BOD reduction of 40 per cent and suspended solids reduction of 60 per cent. During this period the BOD loading averaged 64 per cent of design.

SLUDGE DIGESTION AND DISPOSAL

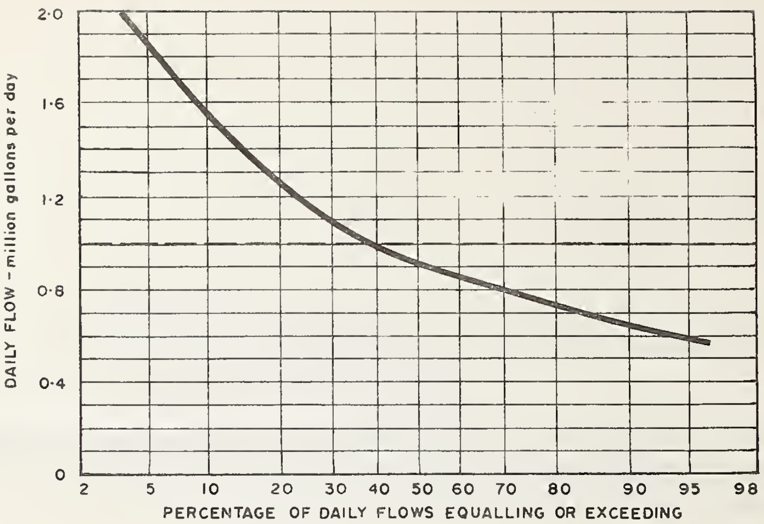
A total of 497,400 gallons of raw sludge with an average total solids concentration of 3.7 per cent was pumped to the digester. A total of 16,500 gallons of digested sludge with an average total solids of 5.5 per cent was removed by tank truck.

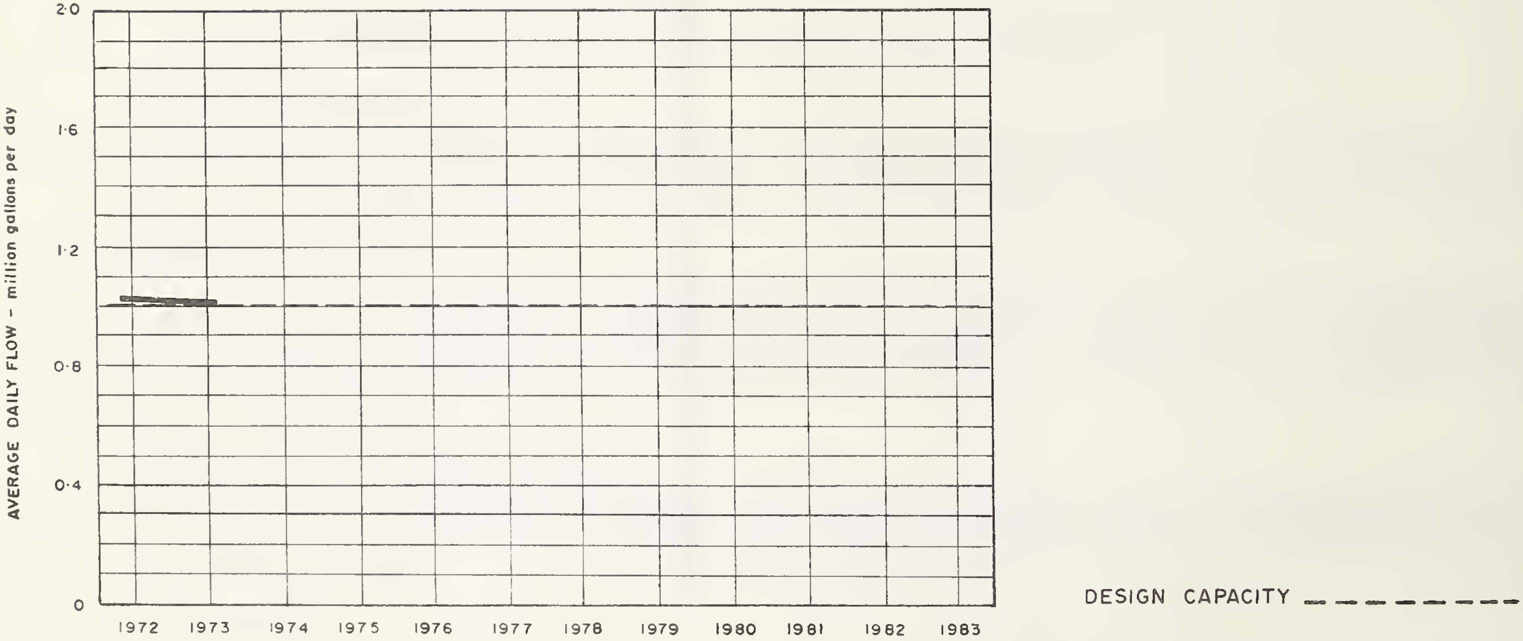
CONCLUSIONS

The plant operated satisfactorily during 1973. Efforts should be made to reduce the flows received by the plant in excess of the design capacity during the spring and fall periods.

PROCESS DATA

FLOWS

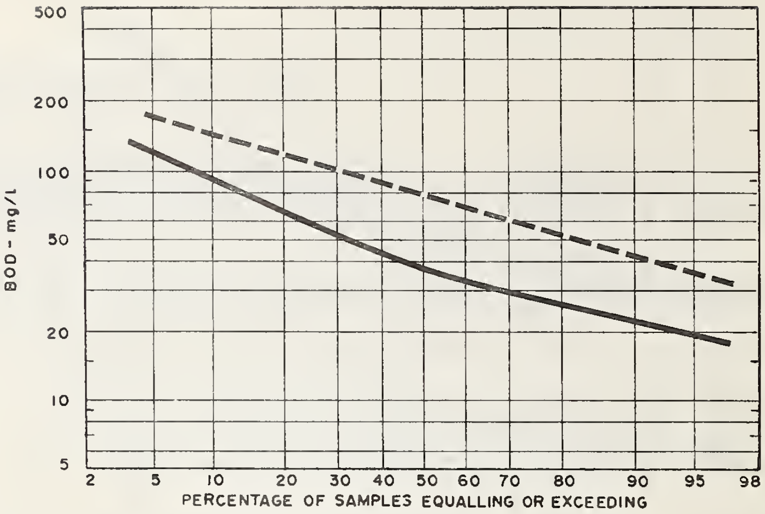

DAILY FLOW - million gallons per day
2·0
1·6
1·2
0·8
0·4
0
2
5
10
20
30
40
50
60
70
80
90
95
98
PERCENTAGE OF DAILY FLOWS EQUALLING OR EXCEEDING

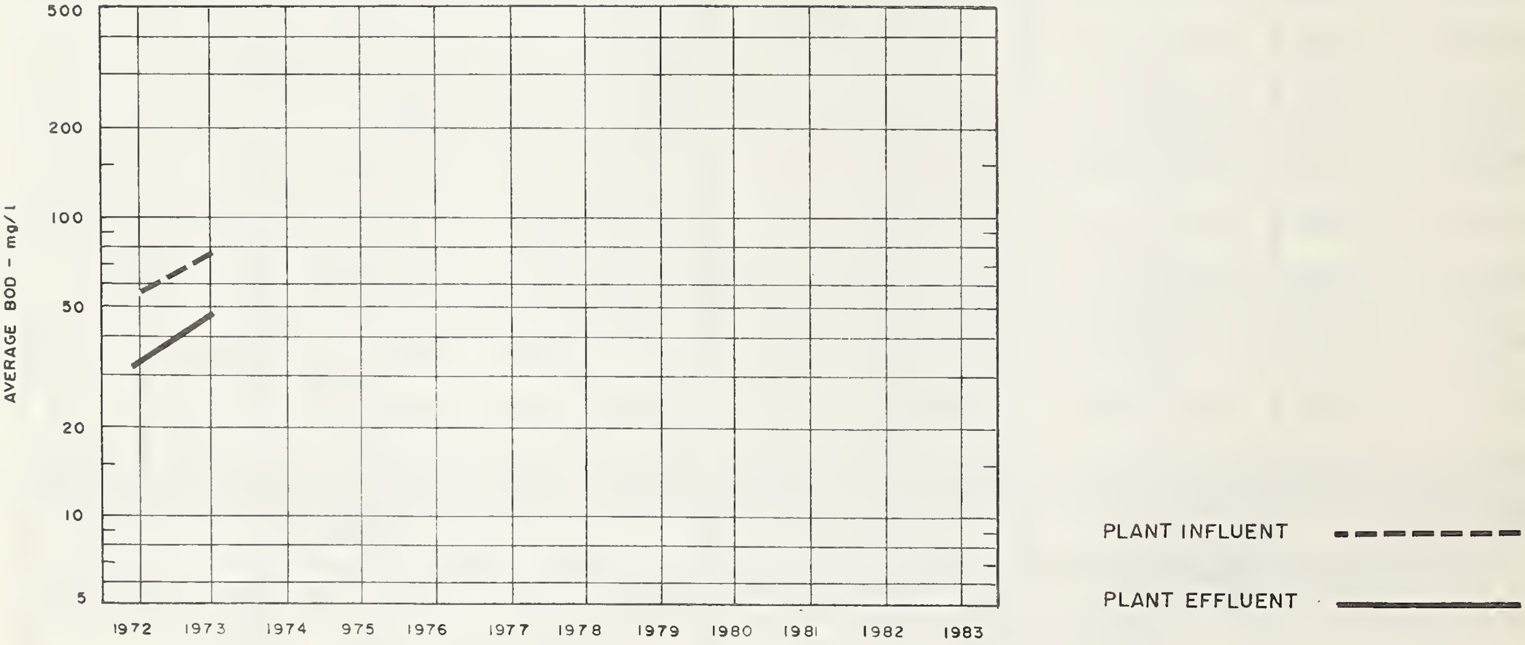

AVERAGE DAILY FLOW - million gallons per day
2·0
1·6
1·2
0·8
0·4
0
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
DESIGN CAPACITY - - - - - - -

PLANT PERFORMANCE

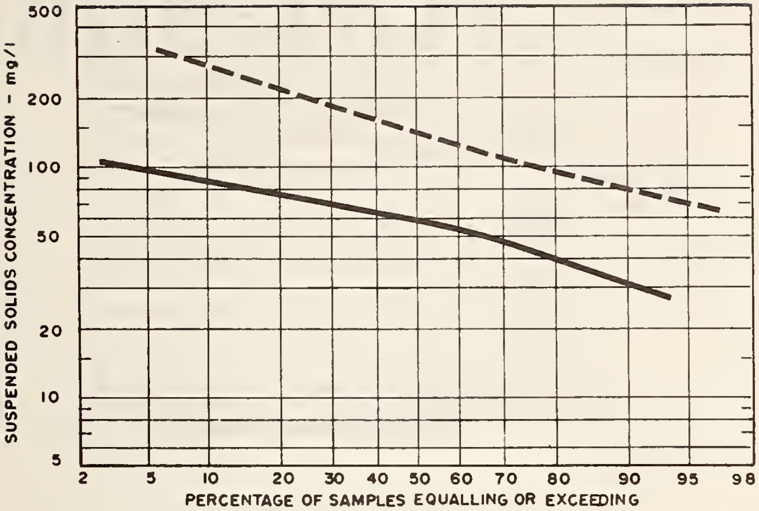
MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10^3 pounds			%	10^3 pounds		
JAN	42.96	1.39	2.00	50	29	42	9	65	25	62	17	3.8	2.6
FEB	29.98	1.07	2.75	61	80			105	42	60	19	4.4	3.0
MAR	47.70	1.54	3.71	56	27	52	14	108	55	49	25	2.4	1.6
APR	39.52	1.32	2.18	80	42	48	15	140	52	62	34	3.6	2.0
MAY	36.97	1.19	1.73	52	26	50	10	200	45	77	55	3.8	1.8
JUNE	28.36	0.85	1.23	70	39	44	9	220	75	66	41	4.0	3.5
JULY	22.63	0.73	0.96	52	30	42	5	100	50	52	12	3.7	2.3
AUG	21.29	0.69	0.87	50	22	56	6	210	60	71	32	3.6	2.5
SEPT	20.99	0.70	0.92	85	50	41	7	160	100	38	13		
OCT	20.26	0.65	1.11	130	64	51	13	310	135	56	35	5.8	3.9
NOV	23.85	0.80	1.09	130	90	31	10	220	68	70	52	2.2	1.9
DEC	35.27	1.14	2.23	110	39	65	25	140	62	55	27	3.2	2.5
TOTAL	369.78	-	-	-	-	-		-	-	-	362	-	-
AVG.		1.01	MAXIMUM 3.71	77	46	40	10	160	63	60	30	3.7	2.5
No. of Samples	-	-	-	24	22	-	-	24	22	-	-	23	21

BIOCHEMICAL OXYGEN DEMAND



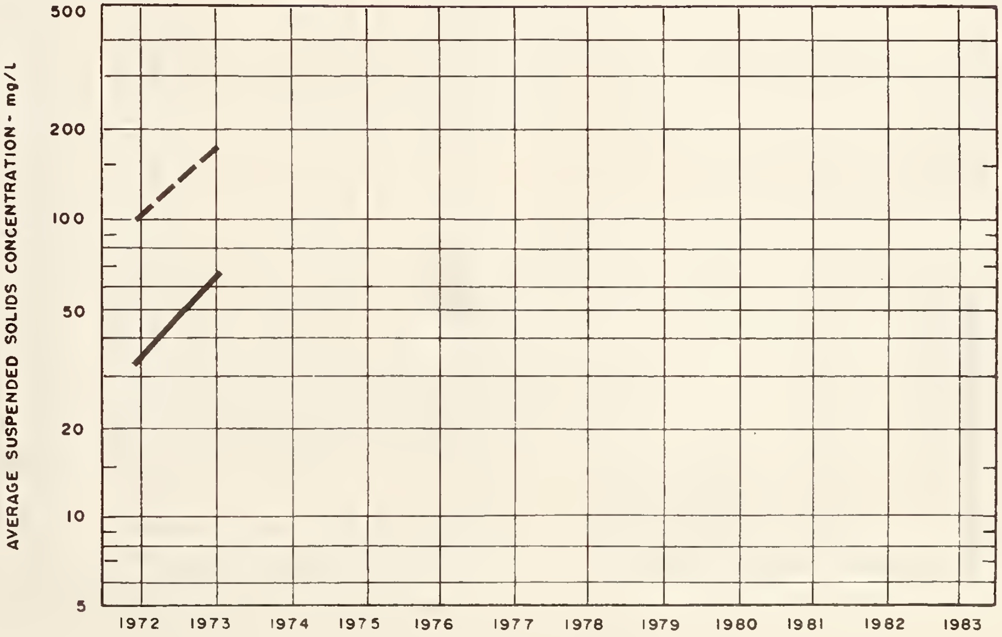


SUSPENDED SOLIDS

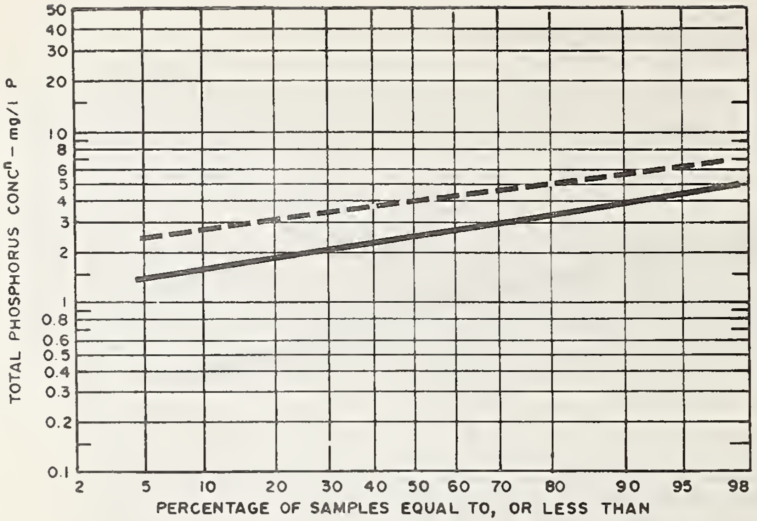


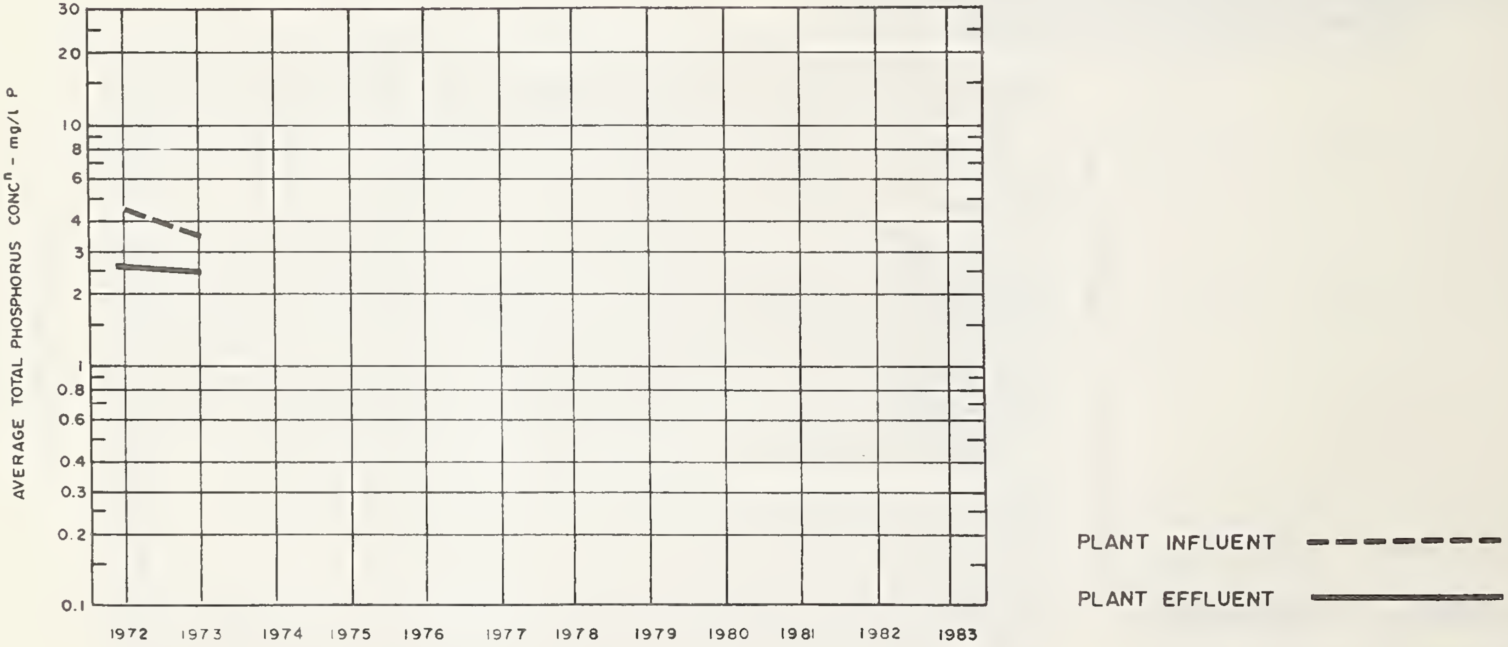
PLANT INFLUENT - - - - - - -

PLANT EFFLUENT ———————

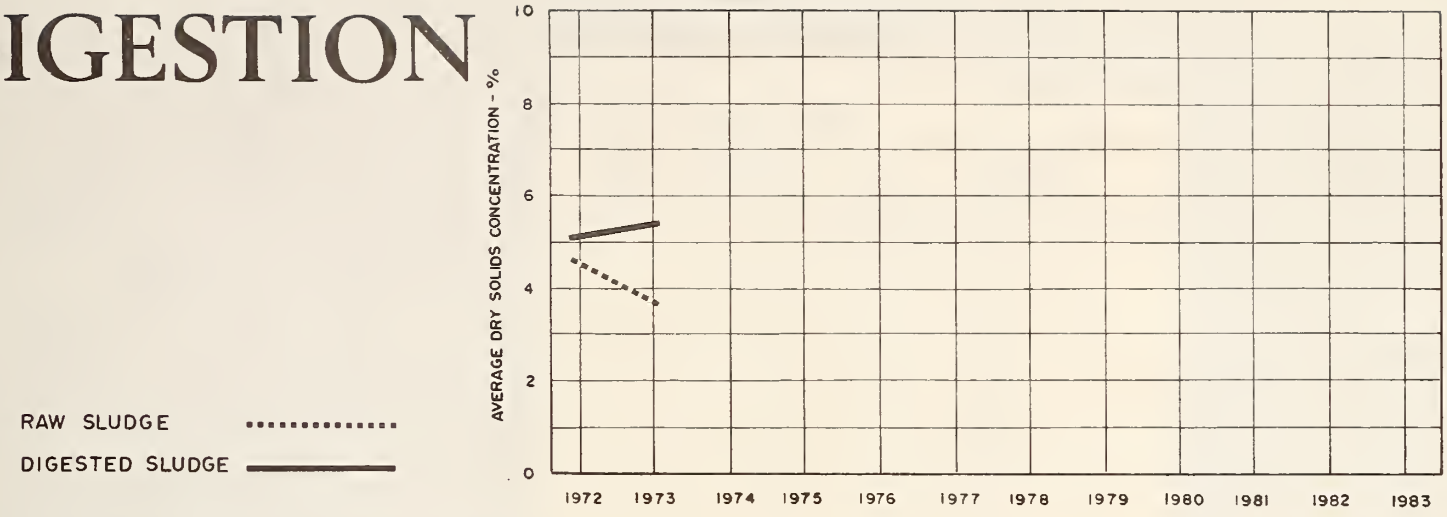


PHOSPHORUS

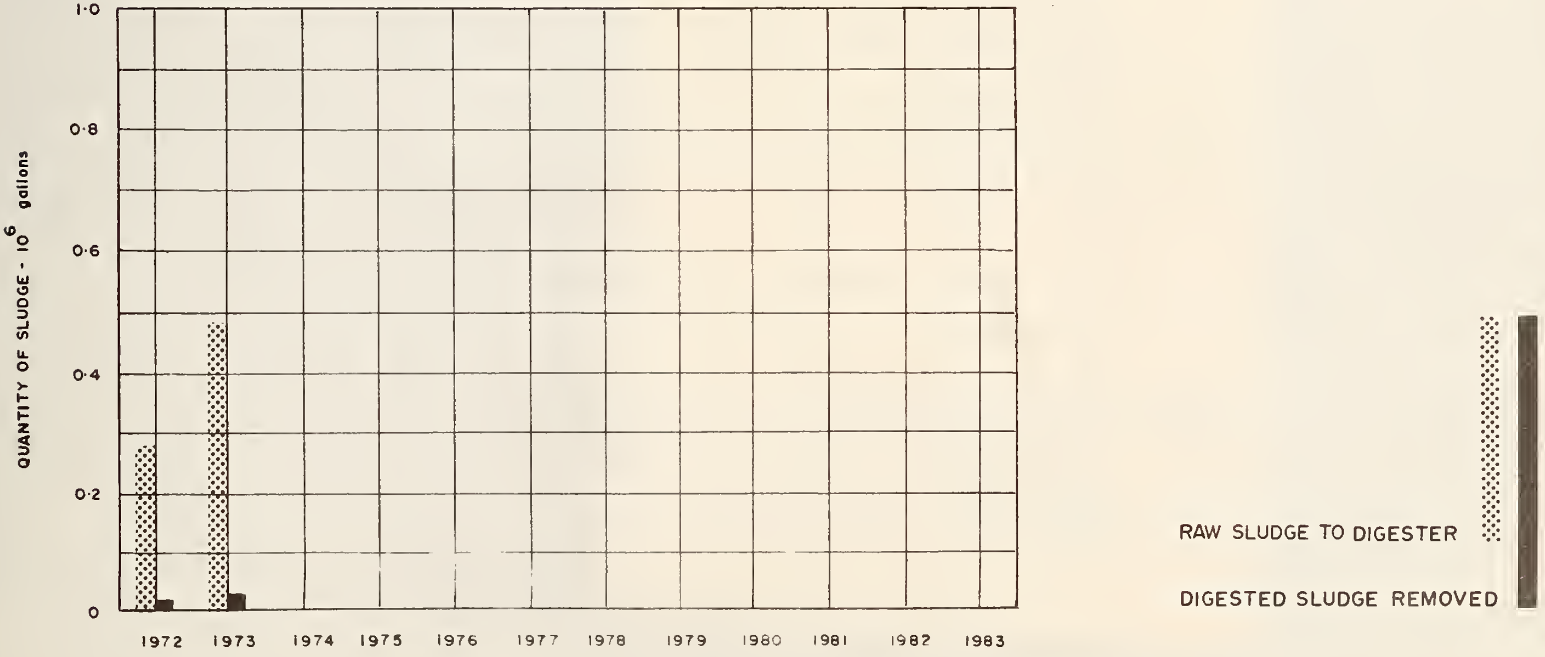

TOTAL PHOSPHORUS CONC^n - mg/l P
50
40
30
20
10
8
6
5
4
3
2
1
0.8
0.6
0.5
0.4
0.3
0.2
0.1
2
5
10
20
30
40
50
60
70
80
90
95
98
PERCENTAGE OF SAMPLES EQUAL TO, OR LESS THAN


AVERAGE TOTAL PHOSPHORUS CONC^n - mg/l P
30
20
10
8
6
4
3
2
1
0.8
0.6
0.4
0.3
0.2
0.1
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
PLANT INFLUENT
PLANT EFFLUENT

DIGESTION



AVERAGE DRY SOLIDS CONCENTRATION - %
10
8
6
4
2
0
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
RAW SLUDGE ▪▪▪▪▪▪▪▪▪▪▪▪▪
DIGESTED SLUDGE ▬▬▬



QUANTITY OF SLUDGE - 10^6 gallons
1·0
0·8
0·6
0·4
0·2
0
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
RAW SLUDGE TO DIGESTER ▨
DIGESTED SLUDGE REMOVED ■

TREATMENT DATA

	GRIT	CHLORINATION		SLUDGE DIGESTION and DISPOSAL							
				RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT	
MONTH	QUANTITY REMOVED cubic feet	CHLORINE USED 10^3 pounds	AVERAGE DOSAGE mg/l	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	QUANTITY REMOVED 10^3 gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	TOTAL SOLIDS %	SLUDGE HAULED cubic yards
JAN	21	1.7	4.0	20.3	2.7		8.6	6.3		0.4	51
FEB	18	1.5	5.0	20.6	2.4	66		2.3	33	0.7	
MAR	36	1.8	3.8	37.9	2.4	62	2.7	4.5	44	0.3	16
APR	32	1.7	4.2	47.4	2.9	63				0.5	
MAY	46	1.7	4.7	50.1	3.3	57				0.2	
JUNE	33	1.3	4.7	48.3	4.8	49				0.9	
JULY	19	1.3	5.8	45.6			1.3	8.7		0.3	8
AUG	37	1.0	4.8	44.9							
SEPT	20	1.1	5.3	43.9			1.3	5.6		0.5	8
OCT	18	1.0	5.2	39.0	4.3		1.3	4.8		1.9	8
NOV	39	1.2	5.2	48.9							
DEC	53	1.7	4.7	50.5	6.5		1.3	6.2			8
TOTAL	372	17.0	–	497.4	–	–	16.5	–	–	–	99
AVG.	1.0 cubic feet/mil gal	1.4	4.6	41.4	3.7	5.9	2.7	5.5	3.9	0.6	17